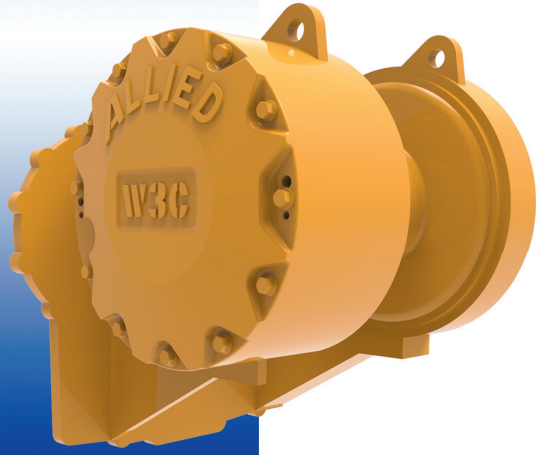
Allied® WINCH

Operating Manual



Allied W3C Towing Winch

This manual must be with the vehicle on which this winch is installed.

Please check the Allied Systems website regularly for updates to this manual.
www.alliedsystems.com

A PRODUCT OF
Allied Systems COMPANY
SHERWOOD, OREGON USA

P/N 2300190W

09/24/2015

Winch Model W3C

Serial Number _____

Date Delivered _____

Date Installed _____

Special Equipment or Attachments

_____

_____

_____

_____

_____

_____

_____

A Product of Allied Systems Company
Sherwood, Oregon USA

09/24/2015
Printed in USA

Foreword

The safe and efficient operation of a winch requires skill and alertness on the part of the operator. To develop the skills required, the operator must:

- Receive training in the proper operation of the winch and the machine on which it is mounted.
- Understand the capabilities and limitations of the winch and the machine on which it is mounted.
- Become familiar with the winch and the machine on which it is mounted and see that they are maintained in good condition.
- Read and understand the SAFETY SUMMARY and OPERATING PROCEDURES contained in this Operating Manual.

In addition, a qualified person experienced in the operation of the winch must guide a new operator through several load handling applications before the new operator attempts to operate the equipment alone. It is the employer's responsibility to make sure that the operator can see, hear, and has the physical and mental ability to operate the equipment safely.

This Operating Manual contains basic information necessary for the operation and maintenance of a winch. Optional equipment is sometimes installed that can change the characteristics described in this manual. Make sure the necessary instructions are available and understood before operating the winch.

Some of the components described in this Operating Manual will NOT be installed on your winch. If you have questions about any item on your winch or described in this Operating Manual, contact your local winch dealer, or contact Allied Systems Company:

Allied Systems Company
21433 SW Oregon Street
Sherwood, OR 97140 USA

Phone: 503-625-2560
Fax: 503-625-7269
E-Mail: marketing@alliedsystems.com

Also visit our website, www.alliedsystems.com, where the most current copy of this manual, and copies of Parts Manual and Service Manual are always available.

NOTE: For repairs and overhaul, contact your Allied winch dealer. If you maintain your own equipment, a service manual is available for your specific winch.

NOTE: This publication may be translated to different languages for sole purpose of easy reference in non-English speaking locations. Should there be differences in interpretations to the text, please refer to the English language edition published by Allied Systems Company as the controlling document.

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Safety Summary

General Safety Notices

The following pages contain general safety warnings which supplement specific warnings and cautions appearing elsewhere in this manual. All electrical and hydraulic equipment is dangerous. You must thoroughly review and understand the Safety Summary before attempting to operate, troubleshoot or service this winch.

The following symbols/terms are used to emphasize safety precautions and notices in this manual:

⚠ DANGER

The "DANGER" symbol indicates a hazardous situation which, if not avoided, will result in death or serious injury. Carefully read the message that follows to prevent serious injury or death.

⚠ WARNING

The "WARNING" symbol appears wherever incorrect operating procedures or practices could cause serious injury or death. Carefully read the message that follows to prevent serious injury or death.

⚠ CAUTION

The "CAUTION" symbol appears where a hazardous situation which, if not avoided, could result in minor to moderate injury and equipment damage.

NOTICE

This signal word alerts to a situation that is not related to personal injury but may cause equipment damage.

NOTE: …

The term "NOTE" highlights operating procedures or practices that may improve equipment reliability and/or personnel performance.

Safety Regulations

Each country has its own safety legislation. It is in the operator's own interest to be conversant with these regulations and to comply with them in full. This also applies to local bylaws and regulations in force on a particular worksite.

Should the recommendations in this manual deviate from those in the user' country, the national regulations should be followed.

NOTE: All possible safety hazards cannot be foreseen so as to be included in this manual. Therefore, you must always be alert to potential hazards that could endanger personnel and/or damage the equipment.

⚠ WARNING

The winch shall not be used for hoisting.

⚠ WARNING

Use hearing protection when operating winches.

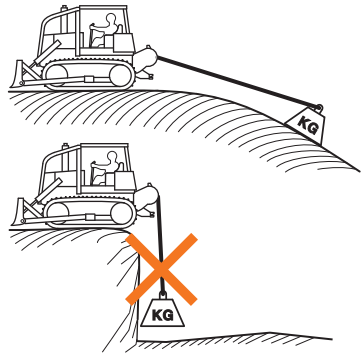
Operation, Inspection, and Maintenance Warnings

Obey the following cautions and warnings before using your winch to avoid equipment damage, personal injury or death.

- Do not operate the winch unless you are authorized and trained to do so.
- Do not operate the winch unless the vehicle is equipped with a screen to protect the operator if the wire rope breaks.
- Read, understand, and follow the operating, inspection, and maintenance instructions in this Operating Manual.
- Do not use the control levers for hand holds when entering or leaving the vehicle.
- Do not permit other people near the control area when you inspect or repair a machine.
- Never inspect, repair, or perform maintenance on a machine that is in motion.
- Inspect the winch before each use:
  - » Make sure that the controls and instruments operate correctly.
  - » Report the need for repairs immediately.
  - » Do not work with a damaged or worn wire rope.
  - » Do not use a winch that needs repairs.
  - » If the wire rope and ferrule must be removed from the drum, make sure the end of the wire rope and ferrule are controlled when the ferrule is released. The end of the wire rope can suddenly move from the drum like a compressed spring when the ferrule is released and cause an injury.
- Stay in the operator's seat when operating the winch.
- Do not stand on the vehicle when operating the winch.
- Avoid winch operation near people or other machines.

- Never stand nor permit others to stand in the bight (loop) of a wire rope.
- Do not stand nor permit others to be near the winch or wire rope when there is tension on the wire rope.
- Observe jobsite rules.
- Be in complete control at all times.
- Do not use the control levers as hangers for clothes, water bags, grease guns, lunch pails, etc.
- Do not leave the vehicle when the winch wire rope is under tension.
- Do not permit riders on the vehicle or load.
- Do not use the winch as an anchor for a double or two-part line.
- Do not pull the hook through the throat or over the drum, which will cause damage.
- When the winch is not in use, make sure the control lever is in **BRAKE-ON** position and the winch brake is applied.

- Do not use winch as a hoist. Tractor and skidder mounted winches are designed for towing.



- Always inspect wire rope, tail chain and other rigging components for wear, damage, broken strands or abuse before use.
- Never use wire rope, tail chain or other rigging that is worn-out, damaged or abused.
- Never overload wire rope, tail chain or rigging.

- Wire rope and tail chain will fail if worn-out, overloaded, misused, damaged, improperly maintained or abused. Wire rope or tail chain failure may cause serious injury or death!

- Do not terminate wire rope to tail chain by the use of a knot.
- Do not handle wire rope if the hook end is not free. A load could break away, suddenly tensioning the wire rope, resulting in serious injury or death.
- Stay clear of wire rope entry areas (fairlead or arch rollers, winch drum etc).
- Make sure ground personnel are in plain view of the operator, and at a distance of at least 1½ times the working length of the wire rope.
- Make sure that any hand signals used by ground personnel are clearly defined and understood by everyone involved.
- Do not attempt to “jerk” or “shock” a load free. Doing so can cause loads in excess of the rated capacity of the wire rope, winch, or mounting hardware.
- Replace any parts only with genuine Allied Winch parts. Refer to parts manual 2300191W.
- Maintain **a minimum of three (3) complete wraps of wire rope** on the drum for normal operation. It may help to paint the last five wraps of wire rope a contrasting color, to serve as a visual indicator.
- Do not handle wire rope with bare hands. Wear leather gloves at all times.
- Align the tractor with the load to prevent side loading the winch, and to maintain even spooling of the wire rope.

- If applying tension to the wire rope manually during spooling:
  - » ensure that the operator is winching in slowly,
  - » keep your hands and clothing well clear of any rollers or the winch drum,
  - » do not maintain tension by letting the wire rope slip through your hands,
  - » use a hand-over-hand technique to maintain tension.
- Be aware of the ground conditions, and make sure the ground and tractor are stable enough to pull the intended load.
- Do not attempt to pull loads in excess of the rated capacity of the winch.
- Keep yourself informed of any applicable codes, regulations and standards for the job.
- This winch is not rated for any application involved in the lifting or moving of personnel.
- Use only the lubricants listed in the Recommended Oil List. See Page 4.
- Do not weld on any part of the winch. Contact Allied Systems if weld repairs are needed.
- The hydraulic system must be kept clean and free of contamination at all times.
- Be aware of the hazards of pressurized hydraulics:
  - » Wear personal protective equipment, such as gloves and safety glasses, whenever servicing or checking a hydraulic system.
  - » Assume that all hydraulic hoses and components are pressurized. Relieve all hydraulic pressure before disconnecting any hydraulic line.
  - » Never try to stop or check for a hydraulic leak with any part of your body; use a piece of cardboard to check for hydraulic leaks.
  - » Small hydraulic hose leaks are extremely dangerous, and can inject hydraulic oil under the skin, even through gloves.
  - » Infection and gangrene are possible when hydraulic oil penetrates the skin. See a doctor immediately to prevent loss of limb or death.

Notes

Notes

General

Introduction

This Operating Manual contains basic information necessary for the operation and maintenance of the W3C winch.

How the Winch Operates

A winch is normally installed on a skidder or tractor to:

- increase the pulling power of the skidder or tractor.
- reach into an area where a skidder or tractor cannot go.
- make lift functions available when special attachments are installed.

The winch has a hydraulic clutch that is similar to a hydraulic (powershift) transmission. Each tractor and skidder has a power take-off (PTO) that is used to connect the power from the engine to the winch. The **SCH** (Self Contained Hydraulics) indicates that the entire hydraulic system that controls the winch is inside the winch case.

When the PTO is operating, a hydraulic pump in the winch case takes hydraulic oil from the winch sump and sends it to the hydraulic control valve. The hydraulic control valve controls the operation of the winch.

The PTO is connected to the winch's input shaft. The input shaft turns the housing of the clutch. When the clutch is applied, power is transmitted by the gears to the drum. As the drum rotates, wire rope is pulled into the winch.

The W3C winch has the following operations:

- **LINE-IN (For "PFR" Line-in/Line-out)**
- **BRAKE-ON**
- **FREESPOOL**
- **BRAKE-OFF**

The winch has a gear assembly inside the drum. The inner gear can slide on splines and is engaged with the outer gear by a spring. When the control lever is in the **FREESPOOL** position the inner gear is disengaged from the outer gear by a hydraulically actuated piston. Only the drum rotates when the gear assembly is disengaged.

The W3C winch has a maximum line pull of 41,200 lbs., rated at 30,000 lbs.

Nameplate

Each winch is shipped from the factory with a nameplate as shown in Figure 1. The rated capacity for the winch, as it is equipped, is shown on the nameplate. Each winch must be operated within its rated capacity. If the nameplate is missing, or the wire rope does not match the information on the nameplate, do not operate the winch until its capacity is known.

ALLIED SYSTEMS COMPANY
21433 SW OREGON STREET
SHERWOOD, OREGON 97140 USA
WWW.ALLIEDSYSTEMS.COM
MODEL:
SERIAL NO.:
MAXIMUM LINE PULL*
BARE DRUM:
MAXIMUM WIRE
ROPE DIAMETER:
*LIMITED BY WIRE BREAKING STRENGTH. MAY BE LOWER DUE TO AVAILABLE POWER FROM WINCH CARRIER. CONTINUOUS LINE PULLS SHOULD BE LESS THAN WINCH CARRIER GVW.
MADE IN USA
2315005 REV B

Figure 1 - Nameplate

Wire Rope Selection

Each winch model can have a variety of wire rope sizes installed by the user. The maximum wire rope size is shown on the nameplate. See Figure 2 for approved wire rope sizes and drum capacities. When a larger diameter wire rope is used, the length of wire rope installed on the drum will be shorter. In some situations, the winch can create a tension in the wire rope that is greater than the strength of the wire rope. The user must be careful to select a wire rope that has enough strength and length for the job.

⚠ WARNING

During operation of the winch, the operator must know or estimate the line pull and make sure that the line pull is within the capacity of the winch and the specifications of the wire rope installed on the drum. A broken wire rope under high tension can return suddenly in the direction of the winch and cause injury and damage.

For maximum wire rope strength, there should be at least three wraps of wire rope on the drum. Painting the last ten feet red will alert the operator that the wire rope is coming to the end of its length.

Wire Rope Diameter	Drum Capacity
1/2 in. (13 mm)	234 ft. (72 m)
5/8 in. (16 mm)	227 ft. (69 m)
3/4 in. (19 mm)	160 ft. (49 m)
NOTE: Loosely or unevenly spooled line will reduce capacities.	

Figure 2 - Wire Rope Size and Capacities

Approved Oil List & Capacity

The type of oil used affects the line control. Use the following oils in the W3C winch for improved performance:

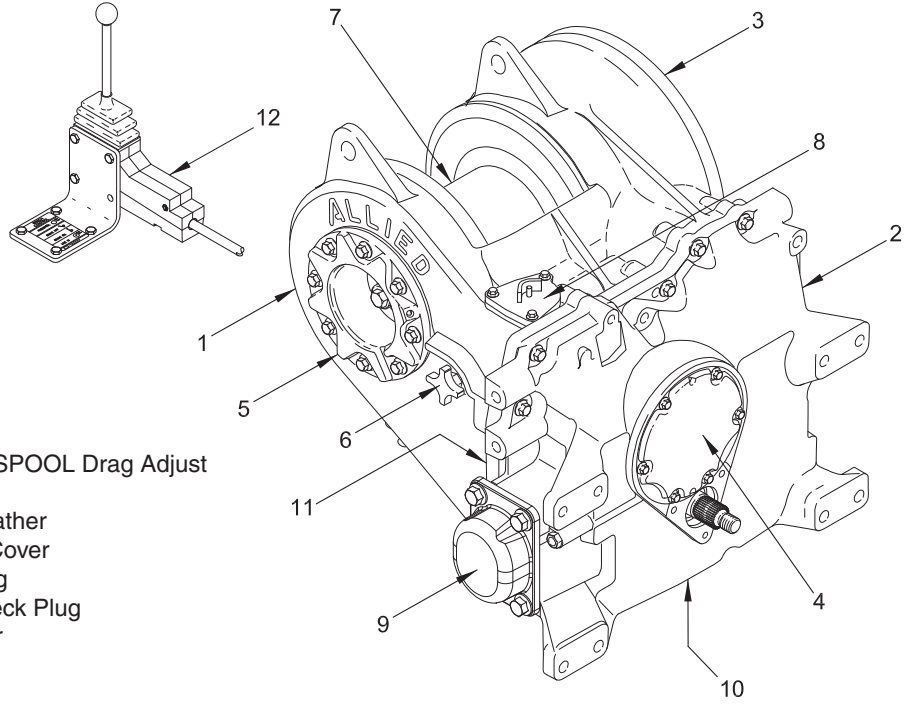
Oil Company	Oil Brand
Amoco Oil Company	Amoco 1000 Fluid
Exxon Company	Hydraul 560
John Deere	Hy-Gard Transmission & Hydraulic Oil
Sun Oil Company	Sunfleet TH Universal Tractor Fluid

Figure 3 - Approved Oil List

NOTE: For operation in temperatures below -23°C (-10° F), use John Deere J20D "Low Viscosity Hygard" or equivalent.

The oil capacity for the W3C is **5.5 gallons (20.8 liters)**.

W3C Winch Description



1. Frame
2. Cover, Front
3. Cover, LH
4. Cover, Brake
5. Cover, RH
6. Knob, FREESPOOL Drag Adjust
7. Drum
8. Oil Filler/Breather
9. Oil Strainer Cover
10. Oil Drain Plug
11. Oil Level Check Plug
12. Control Lever

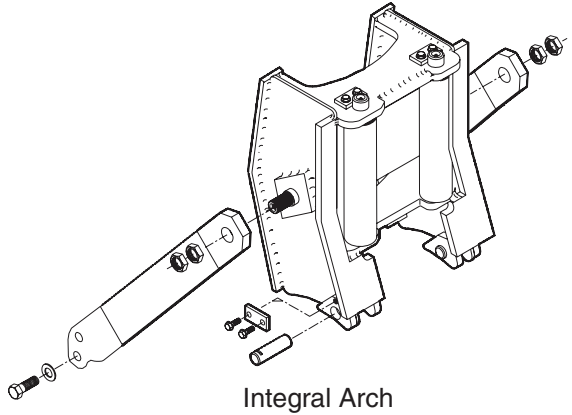
Figure 4 - W3C Towing Winch

Optional Equipment

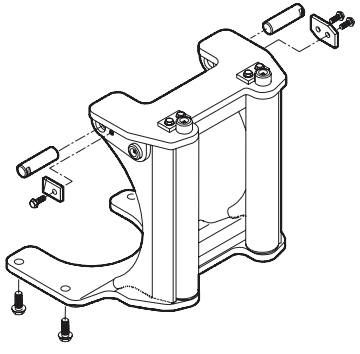
The W3C winch may be equipped with the following options:

- fairlead assembly
- alternate gear ratio
- integral arch
- drawbar
- power forward/reverse (PFR)
- mechanical **FREESPOOL** lock
- extended heavy-duty drawbar

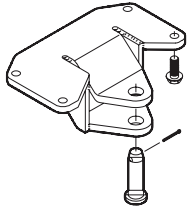
NOTE: Not all optional equipment listed is available for each model of tractor.



Integral Arch



Fairlead Assembly



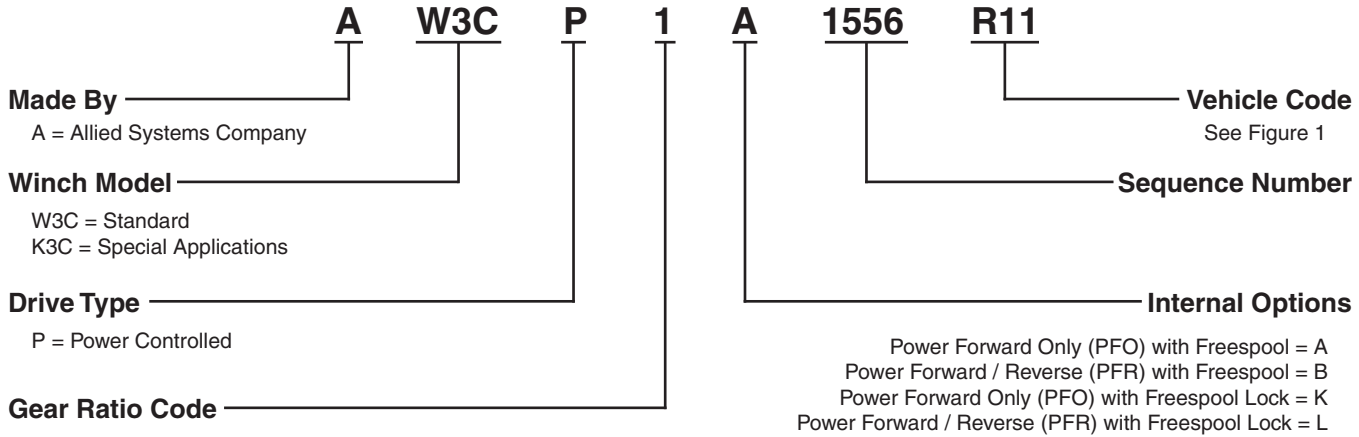
Drawbar

Figure 5 - W3C Towing Winch, Optional Equipment

Serial Number Codes

The nameplate with the serial number code is found on the left front corner of the winch case.

A serial number indicates the following information:


A W3C P 1 A 1556 R11
Made By
A = Allied Systems Company
Winch Model
W3C = Standard
K3C = Special Applications
Drive Type
P = Power Controlled
Gear Ratio Code
1 = 30.0:1 Crawler (Non Current)
2 = 40.0:1 Crawler (Non Current)
3 = 15.0:1 Skidder (Non Current)
4 = 21.0:1 Skidder
5 = 39.0:1 Crawler
6 = 61.0:1 Crawler
Vehicle Code
See Figure 1
Sequence Number
Internal Options
Power Forward Only (PFO) with Freespool = A
Power Forward / Reverse (PFR) with Freespool = B
Power Forward Only (PFO) with Freespool Lock = K
Power Forward / Reverse (PFR) with Freespool Lock = L

Notes: **1.** In Addition to the serial number plate, the serial number is stamped on the top right-hand side of the frame.

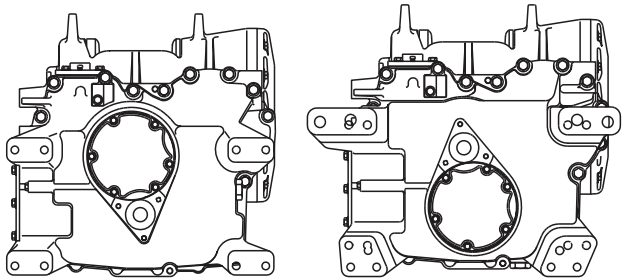
2. Circled letter in **Chart A** indicates high PTO, (H) or low PTO, (L). See the following pages.

3. Circled number in **Chart A** indicates available gear ratios.

Tractor Make Model and Starting Tractor Serial Number Where Applicable									
CODE	**A** **Fiat/Hitachi/ New Holand**	**C** **Caterpillar**	**E** **John Deere**	**F** **KMC**	**H** **Dresser/ Dressta**	**K** **Komatsu**	**R** **Case**	**V** **Ranger**	**W** **Daewoo**
11	FD & FL5, FD & FL7 *a Ⓛ⑤⑥	D3, D3B/C D4B/C, D5C Ⓗ⑤⑥		1000 Ⓗ⑤⑥		D31 & D37 Ⓗ⑥	450-550G/H, 850G/H Ⓛ⑤⑥	F65C/G ④	DD80/80L Ⓗ⑤⑥
12	FD & FL5 *b, FD & FL7 Ⓛ⑤⑥		450G-650G TC, 450G-650G DD*e Ⓗ⑤⑥		TD7E/G, TD8E/G, TD100E/G, 125E/G Ⓗ⑤⑥	D31/D37/ D39-21/21A, KomSat I/II Ⓗ⑥		F66, F67C/P/H, H66, H67 Muller TS22 ④	
13					TD7/8/9H, TD7/8/9/10M, TD9XP Ⓗ	D32/D38/ D39*d ⑤⑥	650-850G/H Ⓛ⑤⑥	J170 ④	
14		D3/4/5B&C DD*c Ⓗ			TD8H DD*c Ⓗ		D85B, D95B, 650/750/850K, 750/850L, DC75/85/95 Ⓗ⑤⑥		
15	DC 100 Ⓗ⑥	D4E DD*c Ⓛ					D85B, D95B, 650/750/850K, 750/850L, DC75/85/95 Ⓛ⑤⑥		

Tractor Make Model and Starting Tractor Serial Number Where Applicable									
CODE	**A** **Fiat/Hitachi/ New Holand**	**C** **Caterpillar**	**E** **John Deere**	**F** **KMC**	**H** **Dresser/ Dressta**	**K** **Komatsu**	**R** **Case**	**V** **Ranger**	**W** **Daewoo**
16	FD80, DC70, DC80 Ⓗ⑥	D3/4/5C Hystat Ⓗ⑥							
30		D5M Ⓗ⑥							
34		D4D, D4E Ⓗ⑥							
360		D4H PS Series I & II Ⓗ⑥							
361		D4H DD Ⓗ⑥							
362		D4H PS Series III, XL, LGP Ⓗ⑥							

*a For 11 tooth tractor spline
*b For 13 tooth tractor spline
*c The following tractor code pairs should be serviced identically: C14=C11, C15=C34 and H14=H13
*d All tractor codes included in this block are H13
*e Gear ratio for 450G-650G DD is ⑥ only



Ⓛ Low PTO Input Ⓗ High PTO Input

Wide & narrow mounting patterns are shown.

Figure 6 - Tractor Identification Codes and Available Gear Ratios

Intentionally Blank

Operation

Operating Procedures

A single control lever is used for PFO winch control (see Figure 7). A second control lever may be used for PFR operation (see Figure 8). The control levers are used to select one of the following operations:

- **LINE-IN (For "PFR" LINE-IN/LINE-OUT)**
- **BRAKE-ON**
- **FREESPOOL**
- **BRAKE-OFF**

Note:

1. When the winch is in **LINE-IN** operation, the control lever is spring returned to **BRAKE-ON** position.

2. All other functions are Detented positions and the control lever must be returned to **BRAKE-ON** position manually.

Power Operation, Power Forward Only (PFO)

Refer to Figure 7.

BRAKE-ON position is a neutral position. The clutch is released, and the brake is spring applied. The winch drum will not turn.

LINE-IN position applies the **LINE-IN** clutch and releases the brake. The winch will wind the wire rope at a speed controlled by the engine or torque converter RPM.

BRAKE-OFF occurs when the operator moves the control lever towards the **BRAKE-OFF** position. The clutch is released and oil pressure releases the brake. This position will permit the wire rope to unwind from the winch against the friction of the clutches, brake, and gear train as the tractor moves away from the load. The **BRAKE-OFF** position is used when the operator has a load on the winch wire rope and wants to move the tractor forward without moving the load, while still keeping the wire rope tight. Wire rope cannot be pulled from the winch by hand. The **BRAKE-OFF** position is different from the **FREESPOOL** position where the drum is disengaged from the gear train.

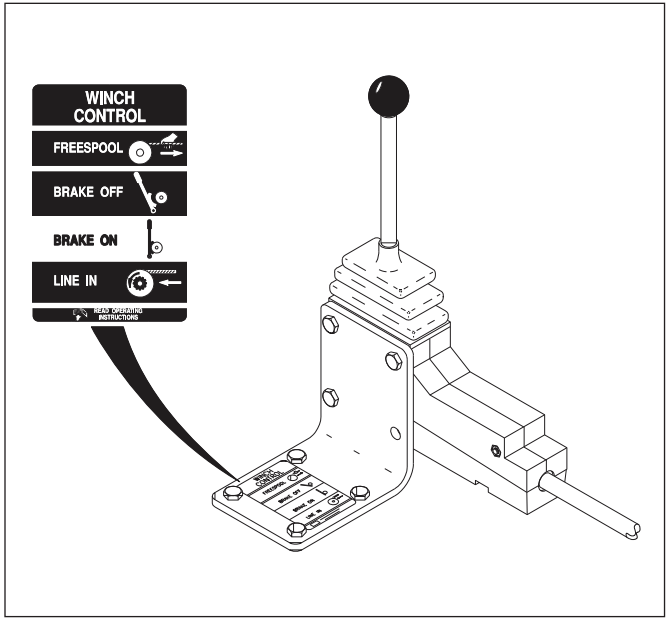


Figure 7 - W3C Operator Controls (PFO)

Power Forward/Reverse Operation (Optional)

Some W3C winches are equipped with the Power Forward/ Reverse option. Two different levers are provided for winches equipped with PFR: the direction lever and the power lever (see Figure 8).

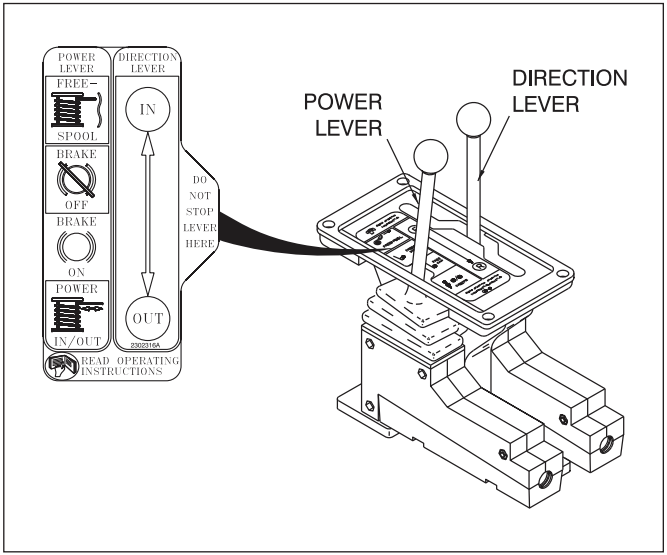


Figure 8 - W3C Operator Controls (PFR)

The direction lever determines the direction of the winch drum rotation. By moving the lever to the **IN** or **OUT** position, a sliding gearset on the clutch shaft engages either the **LINE-IN** gears or the **LINE-OUT** gears. This will give you either forward or reverse.

NOTE: Never leave the direction lever in the centered position. The lever should ALWAYS be as far into either the IN or OUT positions as possible.

When the direction lever is pushed into the **IN** position, the **LINE-IN** gears are engaged. To start reeling wire rope in, pull the power lever into the **POWER-IN/OUT** position.

When the direction lever is pushed into the **OUT** position, the **LINE-OUT** gears are engaged. To start paying wire rope out, pull the power lever into the **POWER-IN/OUT** position.

FREESPOOL Operation

⚠ WARNING

Moving the lever into FREESPOOL while there is a load on the wire rope will cause sudden, uncontrolled loss of load, which can result in injury and damage.

When the control lever is moved into the **FREESPOOL** position, the winch drum is disengaged from the gear train. The brake is also released. **FREESPOOL** operation allows the wire rope to be pulled from the winch drum by hand.

FREESPOOL Drag Adjustment

The **FREESPOOL** drag adjustment knob determines the resistance to rotation of the drum when in **FREESPOOL**. The resistance to rotation is correct when the drum can be rotated by hand, but the drum will not rotate more than one-half revolution freely. A knob on the right side of the frame (see Figure 2) can be used to adjust the **FREESPOOL** drag.

Turn the knob clockwise to increase the drag, or turn it counterclockwise to decrease the drag. See Figure 9.

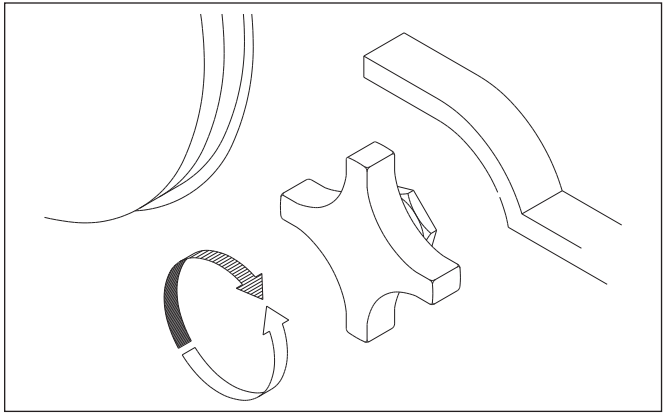


Figure 9 - **FREESPOOL** Drag Adjust

Mechanical FREESPOOL Lock

Some W3C winches are equipped with an optional manually operated mechanical **FREESPOOL** lock. (See Figure 10).

FREESPOOL is hydraulically activated. If the tractor engine is shut off while the winch is in **FREESPOOL**, the hydraulic pressure will gradually leak off until the gears engage and returns the lever to **BRAKE-ON**.

The optional **FREESPOOL** lock is a mechanical stop that prevents the gears from engaging. This will keep the winch in **FREESPOOL** indefinitely even if the tractor engine is off.

The optional **FREESPOOL** lock is controlled from the operator's seat using a push pull cable. Pulling up on the tee handle after the winch control lever has been shifted into **FREESPOOL** will mechanically lock the winch in **FREESPOOL**. The engine may be shut off and the winch will stay in **FREESPOOL**.

If **FREESPOOL** lock is on, the control lever will not have any effect on the drum rotation.

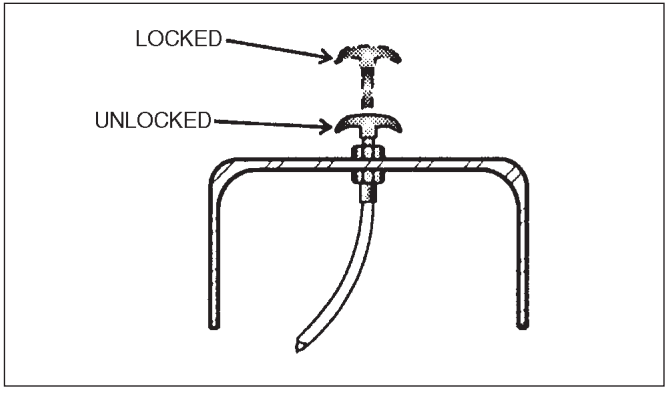


Figure 10 - **FREESPOOL** Lock

Checks Before Operation

Check that the wire rope and hook are not worn or damaged. Check that the periodic inspection and maintenance have been done at the recommended operating hours. See the **Maintenance Schedule** for the W3C winch on page 20.

Checks During Operation

The following **Troubleshooting Chart** can be used by the operator to identify a problem with the winch operation. A trained service person is needed for additional troubleshooting and repair that requires disassembly of parts of the winch.

PROBLEM	POSSIBLE CAUSE	CORRECTION
Operation is rough or not regular.	Hydraulic oil is too cold.	Put the control lever in the **BRAKE-OFF** position. Run the engine at 1000 rpm to warm the oil to 80°F before operating the winch.
	Low oil level.	Add hydraulic oil to the correct level.
	Low oil pressure.	See the Service Manual for additional troubleshooting.
	Wrong oil.	Drain oil and replace with correct grade. Refer to the approved oil list.
	Control cables need adjustment.	Check for correct adjustment. Make sure the ends of the cables are fastened correctly. Verify the handle is not contacting housing.
Hydraulic oil becomes too hot.	Winch is operated in the **BRAKE-OFF** position for long periods.	Use the **BRAKE-OFF** position less. When the **BRAKE-OFF** position is used, the hydraulic oil flows continuously through the relief valve. See the Service Manual for additional troubleshooting.
	Low oil level.	Add oil.
	Clogged suction strainer.	Check and clean or replace the suction strainer.
	Defective or improperly adjusted oil relief valve.	See the Service Manual for additional troubleshooting.

Figure 11 - Troubleshooting Analysis Chart (1)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Brake begins to release before the clutch is applied.	Brake is worn or needs replacement.	See the Service Manual for additional information.
Winch brake does not apply or release correctly.	Brake is worn.	See the Service Manual for additional information.
	Control valve or control cable needs adjustment.	
	Low oil pressure.	
Clutch does not apply correctly at low PTO rpm	Accumulator not charged.	Check accumulator.
	PTO speed stalled (0 rpm).	Increase tractor rpm.
	Worn or leaking pump.	Check pump and replace if necessary.
FREESPOOL does not operate correctly.		See the Service Manual for additional troubleshooting, checks and adjustments.
Winch stalls tractor engine during winch shift when tractor RPM is low.	Not enough engine torque.	Increase engine rpm.
	Low accumulator pressure.	See the Service Manual for additional troubleshooting, checks and adjustments.
Winch will not stay in **LINE-IN** or **LINE-OUT** (PFR only).	Handlever not adjusted.	Adjust levers.
	Detent gears damaged.	Replace gears.

Figure 11 - Troubleshooting Analysis Chart (2)

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Maintenance

The Maintenance Schedule is a program that includes periodic inspection and lubrication. Use the operating time on the hour meter of the tractor to determine the maintenance time for the winch. See Figure 12 for the maintenance points on the winch.

1. Plug to Check Oil Level
2. Fill Plug and Breather
3. Plug to Drain Oil
4. Cover for Strainer

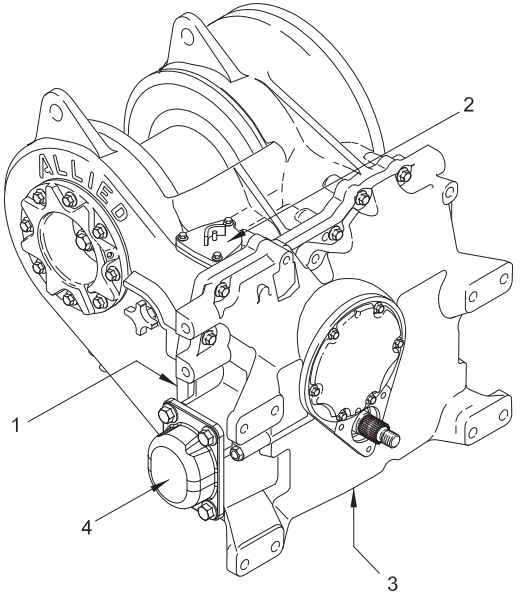

Figure 12 - W3C Winch Maintenance Points

INTERVAL	PROCEDURE OR QUANTITY	SPECIFICATION
50 hours or weekly*	Check oil level at plug (item 1). Add oil as necessary through fill plug (item 2). **Do not operate tractor when checking the oil level.**	See Figure 3, Approved Oil List.
	Clean the breather (item 6).	Remove debris around breather. Clean the breather with solvent if necessary.
	Lubricate the rollers on the integral arch or the fairlead assembly, if the winch is equipped with either of these options.	Use multi-purpose grease with 2-4% molybdenum disulfide.
500 hours or every 3 months	Clean the oil strainer.* Use liquid gasket between the cover and strainer housing (item 4).	See parts manual for oil strainer part number.
	Check the winch control lever linkage adjsutment.	Check that the lever mounting bracket and linkage are fastened correctly. Tighten the bolts as necessary.
1000 hours or every 6 months	Change the hydraulic oil. Drain oil from plug (item 3). Clean the strainer. Add 5.5 gallons (20.8 liters)** through fill plug (item 2). Check the oil level at oil level check plug (item 1).	See Figure 3, Approved Oil List.
* NOTE: Clean the oil strainer screen after the first 50 hours on new and rebuilt winches. ** Amount of oil may vary slightly with tractor.		

Figure 13 - Maintenance Schedule

Control Cable Adjustment, PFO

Check the operation of the control lever to make sure it moves smoothly and will return to **BRAKE-ON** position. The control lever will stay in **BRAKE-OFF** or **FREESPOOL** position, as they are both detent positions. Make sure the control lever does not hit the housing at the end of its travel. Check that the positions of the control lever align with the position indicators on the control lever decal.

Remove the access cover on the housing to make adjustments. Loosen the jam nut that keeps the adjustment nut and clevis from turning. Remove the cotter pin and link pin from the clevis. Turn the adjustment nut and clevis to adjust the length of the control cable. Use the link pin and cotter pin to connect the clevis to the control handle again and check the operation. When the adjustment is complete, tighten the jam nut and install the access cover.

1. Access Cover
2. Clevis
3. Tall Nut
4. Cotter Pin and Link Pin
5. Control Cable
6. Control Lever
7. Screw
8. Jam Nut
9. Screw

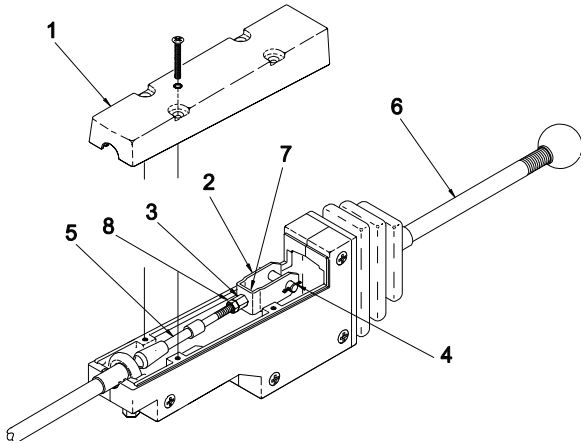

Figure 14 - Control Cable Adjustments

Control Cable Adjustment, PFR

⚠ CAUTION

Improper adjustment of the PFR control levers will cause damage to the winch. Lever adjustment maintenance is necessary.

Power Lever Adjustment

The power lever should align with the **BRAKE-ON** slot when the winch is in **BRAKE-ON** (see Figure 15). If the power lever doesn't align with the slot, its control cable must be adjusted.

1. Remove the control lever assembly from the tractor.

2. Remove the aluminum bottom cover from the control lever housing by removing the two Phillips head screws (see Figure 16).

3. Remove the cotter and clevis pins to free the clevis from the control lever.

4. Loosen the rear jam nut and adjust the nut inside the clevis by turning the clevis. Adjusting the nut farther onto the cable will move the lever away from the operator. Check adjustment by replacing the clevis pin and operating the lever. Adjust the cable until the lever aligns with the **BRAKE-ON** slot.

5. Tighten the rear jam nut by holding the clevis. Add grease to the clevis pin hole in the control lever base and install the clevis pin and cotter. Test the lever operation before attaching the aluminum housing cover.

6. If the cable cannot be adjusted far enough, the cable must be adjusted at the winch end. **Always adjust the cable at the control lever first.**

7. Before adjusting the cable at the winch end, ensure the cable is routed smoothly and is not twisted. To do this, loosen the capscrews holding the cable to the control lever. Allow the cable to rotate if it is under any strain. If the cable rotates, remove the cover and return to step 4 above.

8. If the cable needs adjustment at the winch, loosen the cover capscrews at the control lever and loosen the jam nut on the power control cable at the winch.

9. To adjust the cable, rotate the metal cable jacket, screwing the cable into or out of the winch. Screwing the cable jacket into the winch will move the control lever towards the operator.

10. Apply grease to the clevis pin and reassemble the clevis pin and cotter. Test the control lever operation before attaching the aluminum housing cover.

11. Be sure to rotate the cable inside the housing to remove any twisting caused by step 9. Tighten the cable jam nut at the winch and the cover capscrews at the control lever.

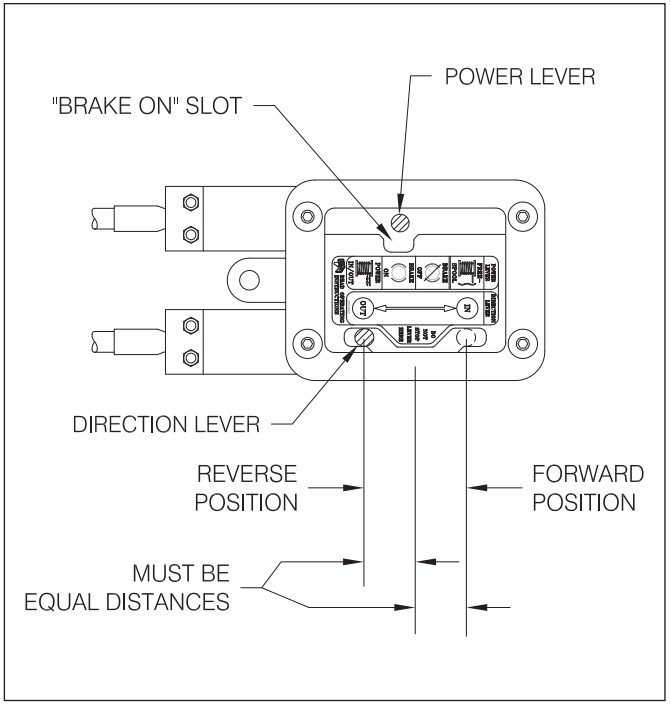

Figure 15 - Proper Control Lever Alignment

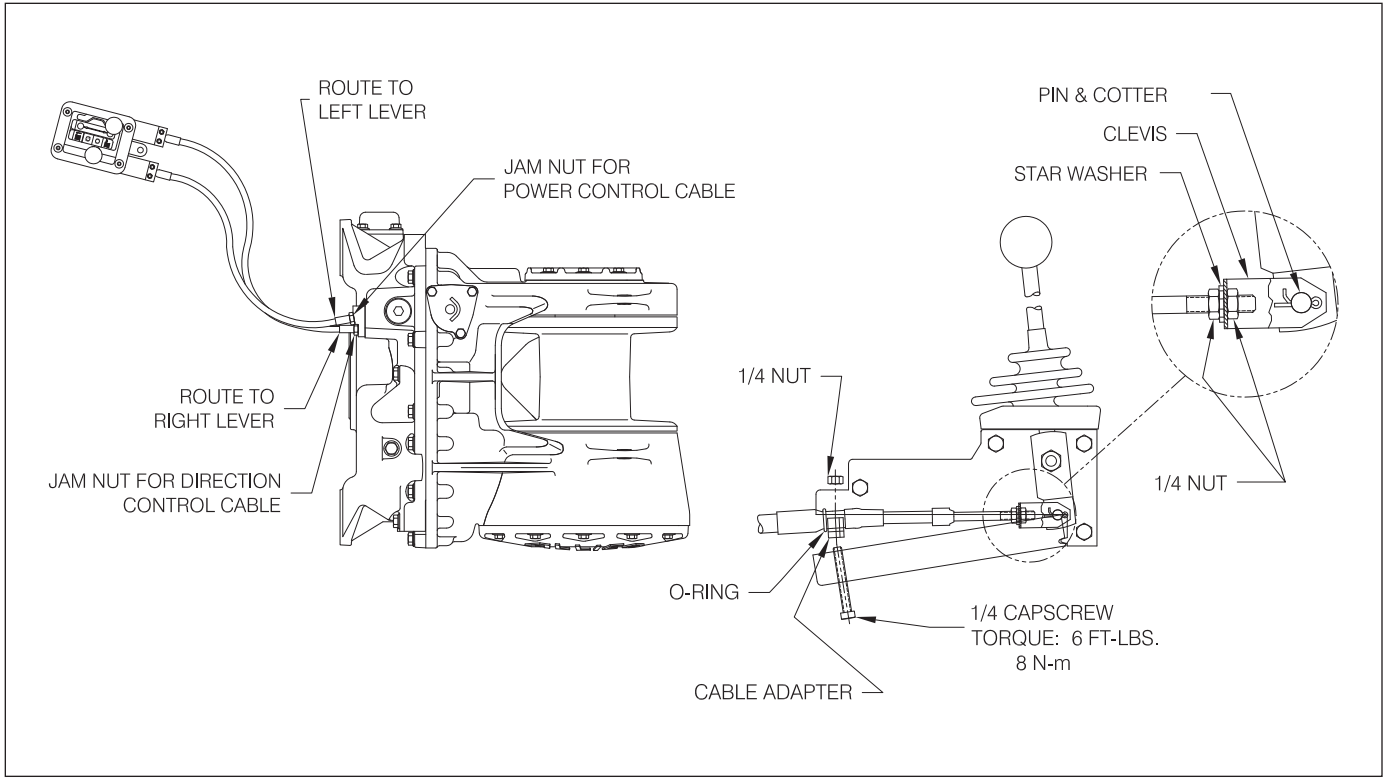

Figure 16 - PFR Control Lever Disassembly and Adjustments

Direction Lever Adjustments

The direction control lever should stay in either the **IN** or **OUT** position. If the direction lever doesn't travel equal distances into **IN** and **OUT** (see Figure 15), its control cable must be adjusted.

1. Remove the control lever assembly from the tractor.

2. Remove the aluminum bottom cover from the control lever housing by removing the two Phillips head screws (see Figure 16).

3. Remove the cotter and the clevis pin to free the clevis from the control lever.

4. Loosen the rear jam nut and adjust the nut inside the clevis by turning the clevis. Adjusting the nut farther onto the cable will move the lever away from the operator. Check adjustment by replacing the clevis pin and operating the lever.

5. Tighten the jam nut by holding the clevis. Add grease to the clevis pin hole in the control lever base and install the clevis pin and cotter. Test the lever operation before attaching the aluminum housing cover.

6. If the cable cannot be adjusted far enough, the cable must be adjusted at the winch end. Always adjust the cable at the control lever first.

7. Before adjusting the cable at the winch end, ensure the cable is routed smoothly and is not twisted. To do this, loosen the cover capscrews holding the cable to the control lever. Allow the cable to rotate if it is under any strain. If the cable rotates, remove the cover and return to step 4 above.

8. If the cable needs adjustment at the winch, loosen the cover capscrews at the control lever and loosen the jam nut on the power control cable at the winch.

9. To adjust the cable, rotate the metal cable jacket, screwing the cable into or out of the winch. Screwing the cable jacket into the winch will move the control lever towards the operator.

10. Apply grease to the clevis pin and reassemble the clevis pin and cotter. Test the control lever operation before attaching the aluminum housing cover.

11. Be sure to rotate the cable inside the housing to remove any twisting caused by step 9. Tighten the cable jam nut at the winch and the cover capscrews at the control lever.

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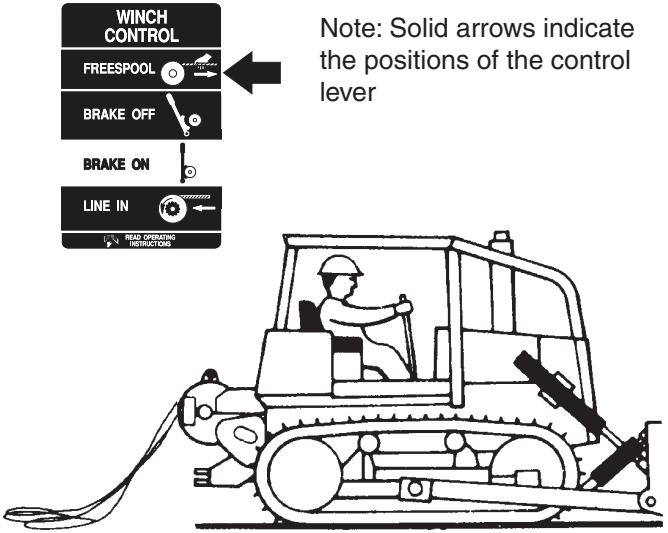
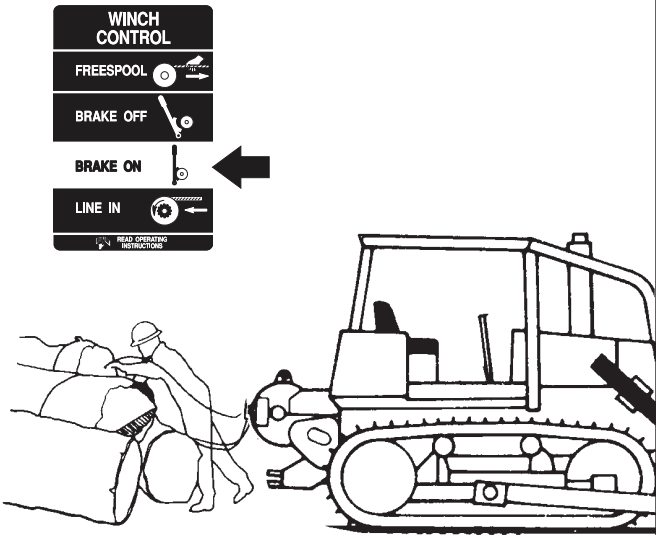
Operating Techniques, PFO

Tractor or Skidder Operation

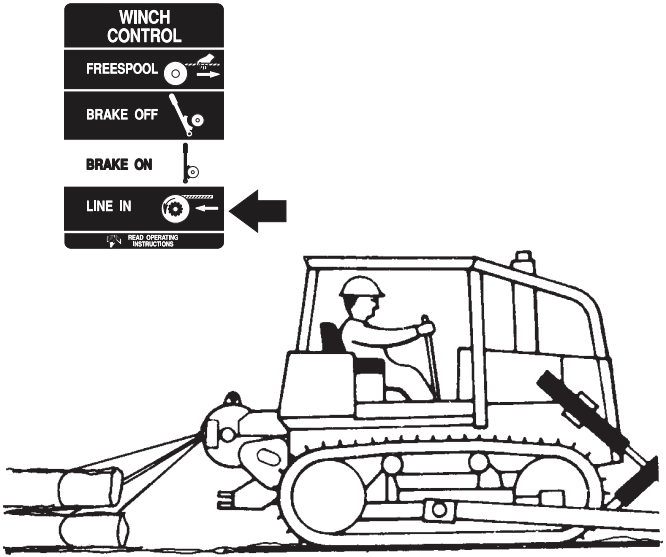


Note: Solid arrows indicate the positions of the control lever

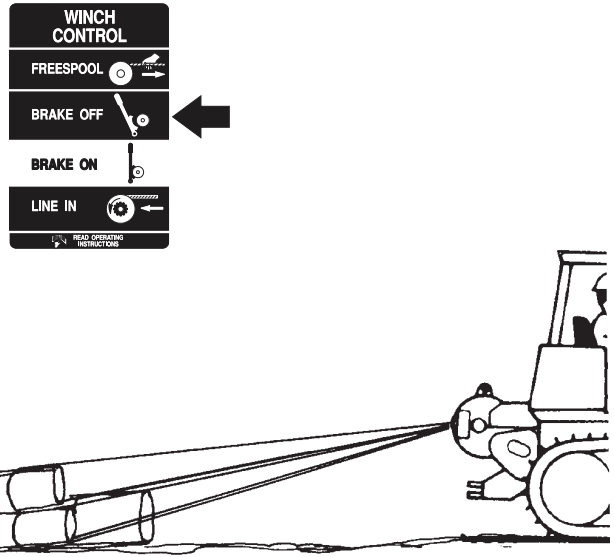


- **Step 1**. The tractor or skidder is moved to an area where a load will be connected. The operator moves the control lever to the **FREESPOOL** position so that the wire rope can be pulled from the winch drum.

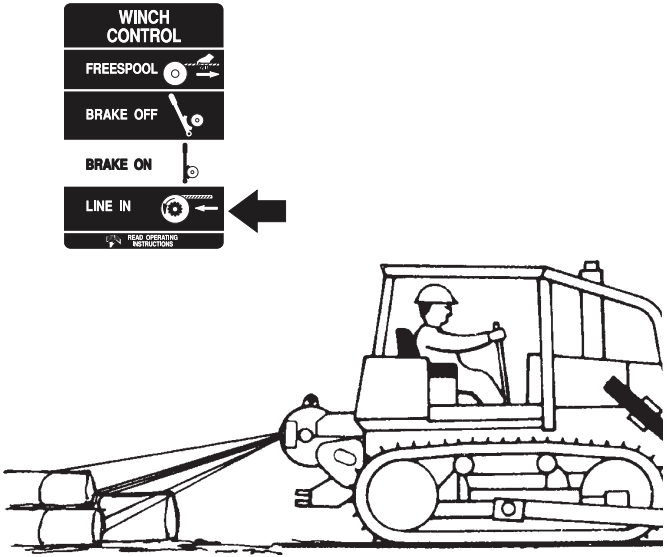
- **Step 2**. A load (logs) is connected to the wire rope. The operator moves the control lever to the **BRAKE-ON** position.



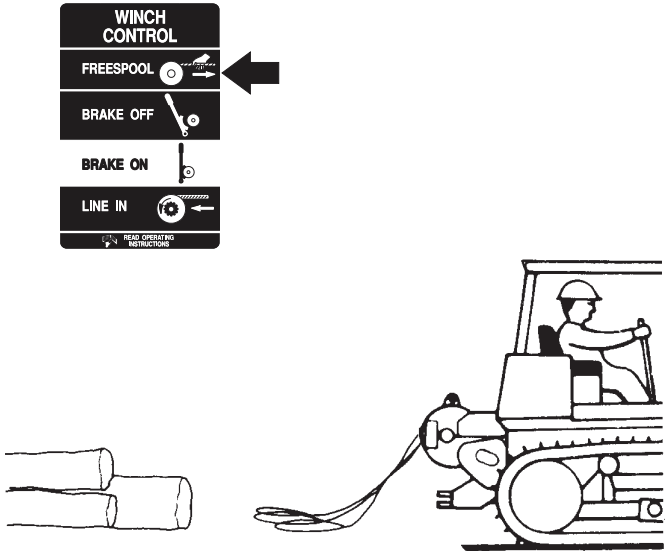
- **Step 3.** The operator can move the control lever to the **LINE-IN** position. If the load is less than approximately 75% of the maximum line pull, the operator can begin traveling with the vehicle at the same time. The winch will wind the load toward the vehicle as it travels. If the load is nearly the capacity of the line pull, the operator must move the load close to the vehicle before beginning to travel.



- **Step 4.** If the tractor or skidder must travel through an area with bad traction conditions, the operator can move the control lever to the **BRAKE-OFF** position. This procedure will permit the vehicle to move through the bad traction area without pulling the load at the same time.



- **Step 5.** When the vehicle is on firm ground, the operator can move the control lever to **LINE-IN** to pull the load toward the vehicle.



- **Step 6.** When the operator wants to disconnect from the load, the vehicle is stopped and the control lever is moved to the **FREESPOOL** position to loosen the wire rope. The wire rope is then disconnected from the load.

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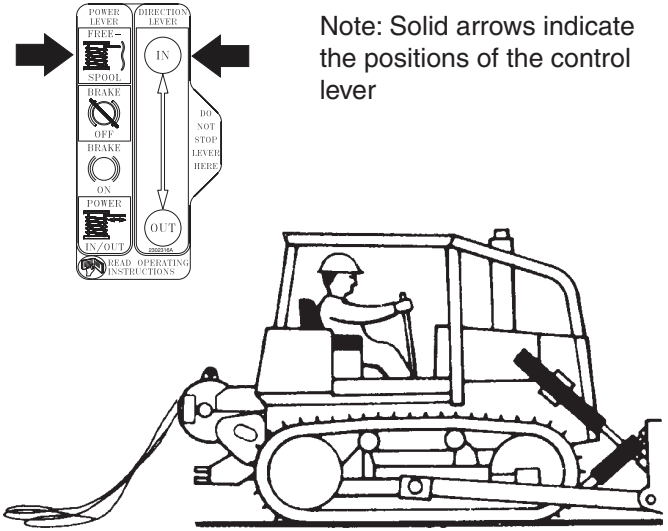
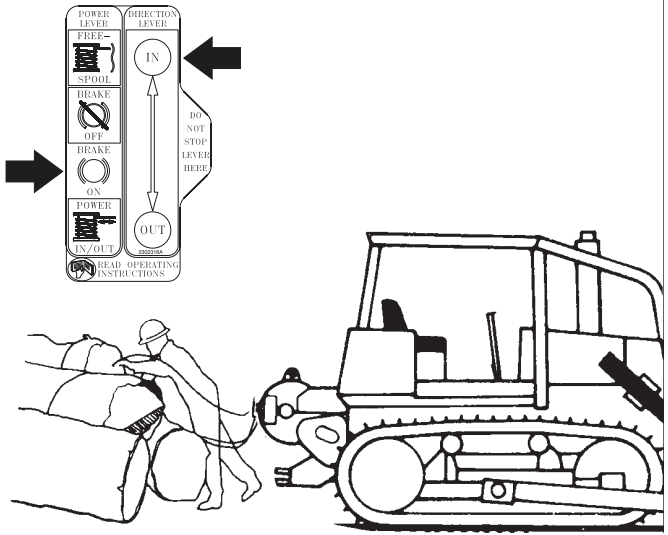
Operating Techniques, PFR

Tractor or Skidder Operation

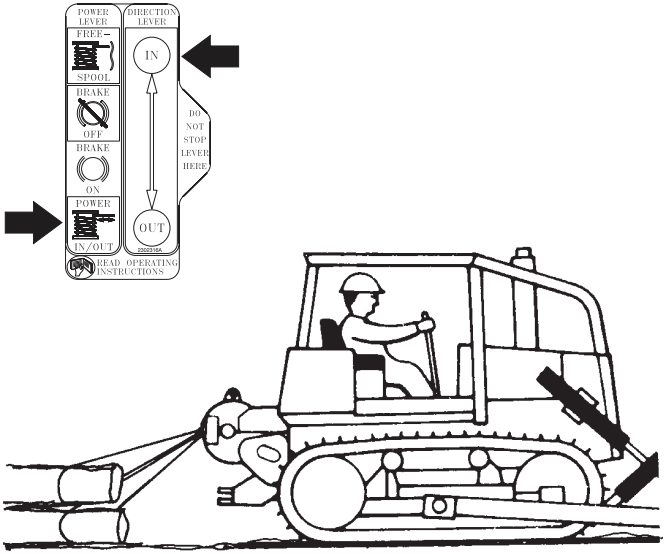


Note: Solid arrows indicate the positions of the control lever

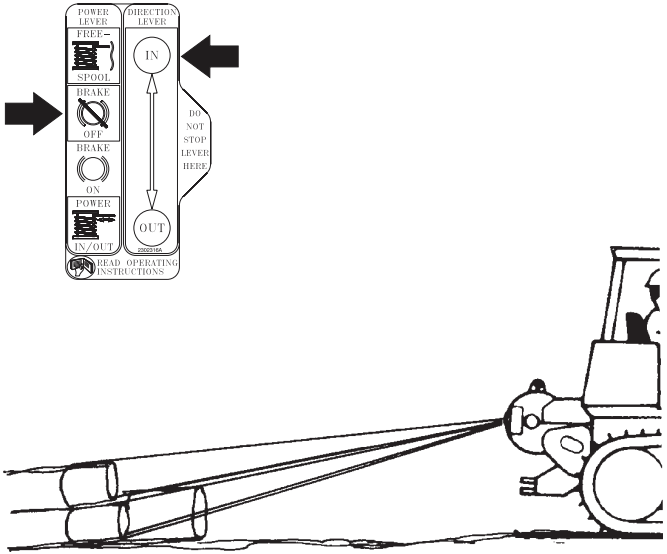
- **Step 1**. The tractor or skidder is moved to an area where a load will be connected. The operator moves the power lever into the **FREESPOOL** position so the wire rope can be pulled from the winch drum.



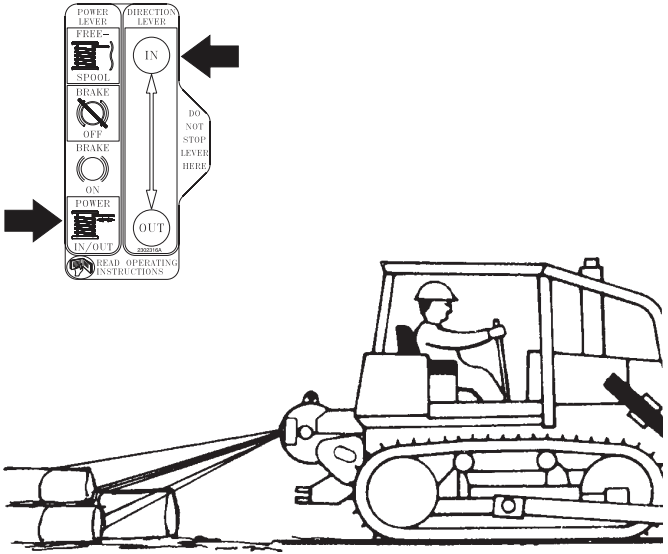
- **Step 2**. A load (logs) is connected to the wire rope. The operator moves the power lever to the **BRAKE-ON** position.



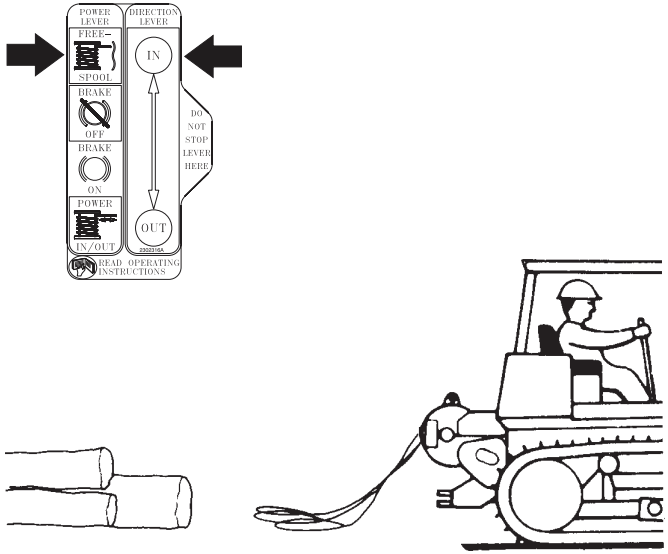
- **Step 3.** The operator moves the direction lever to the **LINE-IN** position and the power lever to the **POWER-IN/OUT** position. If the load is less than 75% of the maximum line pull, the operator can begin traveling with the vehicle at the same time. The winch will wind the load toward the vehicle as it travels. If the load is nearly the capacity of the line pull, the operator must move the load close to the vehicle before beginning to travel.



- **Step 4.** If the tractor or skidder must travel through an area with bad traction conditions, the operator can move the power lever to the **BRAKE-OFF** position. This procedure will permit the vehicle to move through the bad traction area without pulling the load at the same time.



- **Step 5.** When the vehicle is on firm ground, the operator can move the direction lever to **LINE-IN** and the power lever to **POWER-IN/OUT** to pull the load toward the vehicle.



- **Step 6.** When the operator wants to disconnect from the load, the vehicle is stopped and the power lever is moved to the **FREESPOOL** position to loosen the wire rope. The wire rope is then disconnected from the load.

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How to Move a Disabled Vehicle

A. A tractor or skidder often travels in areas where traction conditions are bad. A vehicle equipped with a winch can be used to remove itself from mud or other areas where it cannot move using only the drive wheels or tracks. See Figure 17. Use the following procedure:

1. Fasten the winch wire rope to a structure, tow bar of another vehicle, or a tree that has enough strength for the line pull. The wire rope must be in a direction that is approximately parallel to the direction of travel of the vehicle.

2. Use the throttle to set the engine speed at a power level to operate both the winch and the tracks or drive wheels. (Operator experience is required, because the winch can use most of the engine power in some vehicles.)

3. Put the control lever in the **LINE-IN** position to tighten the winch wire rope. When the winch wire rope is tight, put the vehicle transmission in **REVERSE*** and engage the tracks or drive wheels. Use the power from the engine to the winch and tracks together to remove the vehicle from the bad area.

4. If the vehicle travels faster than the winch winds the wire rope, disengage the transmission until the winch wire rope is tightened again.

*** NOTE: If the tracks or drive wheels on the vehicle stop turning, the torque converter in the transmission has stalled and the winch will stop also. If this happens, put the vehicle in neutral to operate the winch.**

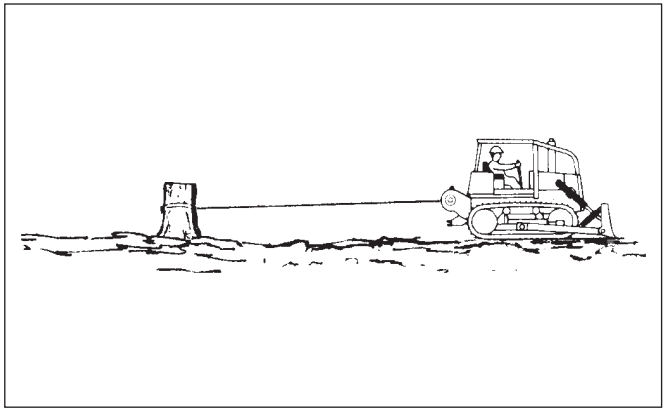

Figure 17 - Moving a Disabled Vehicle (Step A)

B. A tractor or skidder equipped with a winch can be used to pull another vehicle from mud or other areas where it cannot move using only the drive wheels or tracks. See Figure 18. Use the following procedure:

⚠ WARNING

Use extra care if the traction conditions are bad or if the vehicles are on a slope. Bad traction can cause the disabled vehicle or the tractor to slide. A slope can require additional distance to stop the vehicles.

Make sure the wire rope and tow chain have the capacity to do the job. If the disabled vehicle does not have a tow pin or other equipment for towing, carefully fasten the tow chain around the axle of the disabled vehicle. Make sure the tow chain is fastened so that the chain will not cause injury to people or damage the vehicle.

An operator must be on the disabled vehicle to operate the steering and brakes as it is towed.

1. Fasten the winch wire rope to the tow bar of the other vehicle. The wire rope must be in a direction that is approximately parallel to the direction of travel of the vehicle. Apply the brakes on the tractor or skidder. Use the throttle to set the engine speed at a power level to operate the winch. (Operator experience is required, because the winch can use most of the engine power in some vehicles.)

2. Put the control lever in the **LINE-IN** position to tighten the winch wire rope. When the winch wire rope is tight, use the power from the engine to the winch to pull the vehicle from the bad area. If the disabled vehicle moves under its own power, keep the towing wire rope tight so that the wire rope does not pass under the drive wheels or tracks of the vehicle being towed.

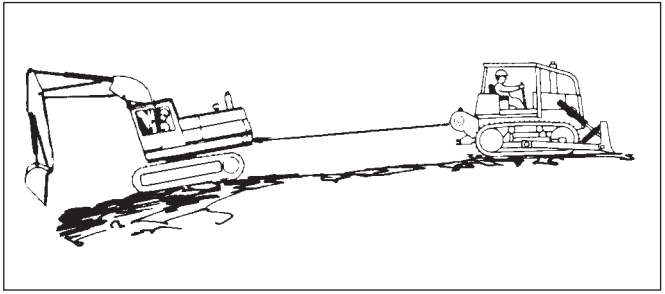

Figure 18 - Moving a Disabled Vehicle (Step B)

Working on a Steep Slope (PFR Only)

⚠ WARNING

The winch and the tractor must be in good condition for the following procedures. Make sure that the required maintenance has been done on the tractor and winch. Use only a wire rope that is in good condition. Make sure the wire rope and winch have enough capacity for the load. Make sure the anchor for the wire rope has enough capacity for the load. A failure of the tractor, winch, or wire rope while working on a steep slope can cause death or injury and loss of equipment.

Tractor is Down the Slope (See Figure 19).

Sometimes a tractor must work on a steep slope and can use a winch to give assistance when moving on the slope. Fasten the winch wire rope to the drawbar of another tractor, a structure or a tree that has enough strength to hold the tractor on the slope.

A. Moving down the slope:

1. Set the throttle on the tractor for the required engine speed.

2. Put the tractor in **FORWARD.** At the same time, move the direction lever to **LINE-OUT** and the power lever to **POWER-IN/OUT** to control the speed of the tractor down the slope.

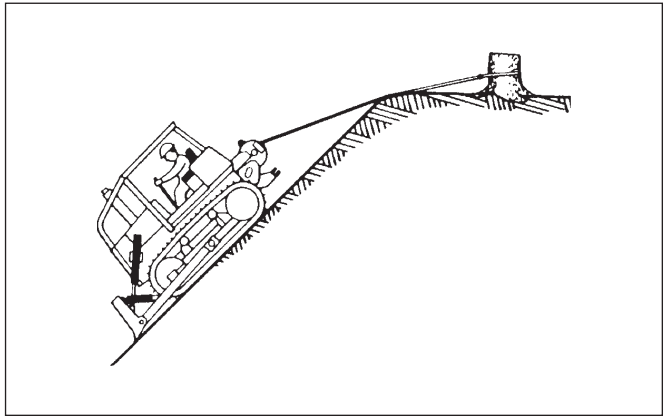

Figure 19 - Working on a Steep Slope

B. Moving up the slope:

1. Set the throttle on the tractor for the required engine speed.

2. Put the direction lever in **LINE-IN** and the power lever to **POWER-IN/OUT** to tighten the winch wire rope. When the winch wire rope is tight, put the tractor transmission in the **FIRST** speed range and **REVERSE** and engage the tracks or drive wheels. At the same time, put the direction lever in **LINE-IN** and the power lever in **POWER-IN/OUT**.

3. Use the steering on the tractor to keep the travel of the tractor in line with the winch wire rope.

4. Fully engage **LINE-IN** as necessary. Do not permit the winch wire rope to loosen and pass under the drive wheels or tracks of the tractor.

Other Equipment is Down the Slope (See Figure 20).

In this operation, the tractor and winch are on stable ground and other equipment is working on a steep slope. The winch is used to give additional control to the equipment working on the steep slope. A winch with a fairlead option is recommended for this operation if alignment of the other equipment with the winch and tractor is a problem.

Make sure the tractor and winch are on stable ground and will not slide when the load is applied. Align the tractor and winch with the load. Apply the parking brake on the tractor.

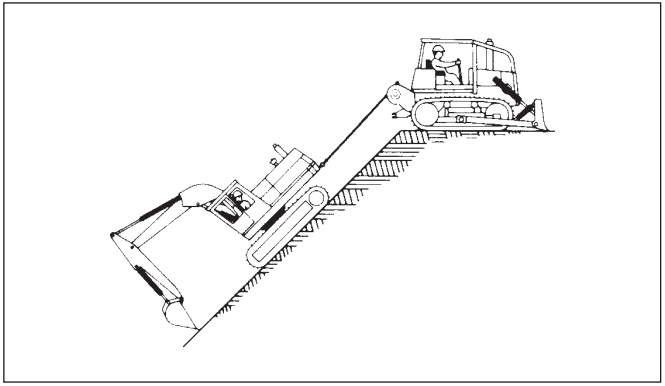

Figure 20 - Other Equipment on a Steep Slope

Working on a Steep Slope (PFR Only)

A. Lowering the equipment on the slope:

1. Set the throttle on the tractor for the required engine speed.

2. Keep the winch wire rope tightened between the tractor and the equipment being lowered down the slope. Put the direction lever in the **LINE-OUT** position and the power lever in the **POWER-IN/OUT** position to control the lowering of the equipment down the slope.

B. Raising the equipment on the slope:

1. Set the throttle on the tractor for the required engine speed. Operator experience is required for this operation so that the load is carefully controlled.

2. Keep the winch wire rope tightened between the tractor and the equipment being lowered down the slope. Use **LINE-IN** to control the raising of the equipment down the slope.

3. Keep the equipment being raised in alignment with the winch and tractor. Do not permit the winch wire rope to loosen and pass under the drive wheels or tracks of the tractor.

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Operational Differences, Optional Equipment

Integral Arch

When using an integral arch, the wire rope passes over a raised horizontal roller and between a set of smaller vertical side rollers and an upper horizontal roller. This causes the winch to pull upwards on loads. In this way the load can be lifted slightly to reduce drag due to ground contact. The side and top rollers act as fairleads to protect the wire rope from damage and from damaging the frame.

Because of the line of action of the wire is higher than normal, the tipping moment applied to the tractor is increased, and the tractor will tip backwards at significantly lower line pulls. The operator must exercise care to not pull more than the tractor can handle stably, especially on side slopes.

Line pulls through the arch also exert higher loads on the fasteners holding the winch to the tractor. For this reason, the wire rope diameter is limited.

Fairlead

A fairlead consists of a set of top and bottom horizontal rollers and side rollers that the wire rope passes between. With this attachment, if the direction of line pull is not within the small window of the fairlead, then the wire rope is pulled across one of the fairlead rollers instead of across the frame, thus protecting both the frame and the wire rope from excessive wear.

Stability of the tractor is affected somewhat by the fact that the fairlead rollers are more rearward than the drum, thus putting slightly more moment on the tractor during side pulls. The operator must take care to assure stability on slopes.

Drawbar

Do not use the drawbar as an anchor point for a multipoint (over puller) line from the winch. Loads applied to the drawbar are transmitted to the bolts holding the winch to the tractor. Standard integral drawbars are designed to handle pulls of 66% of winch rated capacity; bolt on drawbars are 60%. Optional heavy duty and extended drawbars are available which increase the capacity of the drawbar and/or move the pin farther back so it is not under the winch drum.

Optional Gear Ratios

Lower speed ratios allow better operator control of line speed. They may also allow the winch to pull in excess of wire rope or winch rated capacity. They do not increase the durability or damaging load limit of the winch. Line pulls in excess of rated capacity will dramatically reduce the life of winch components.

Notes

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